

## **OREGON COASTAL NONPOINT PROGRAM NOAA/EPA PROPOSED FINDING**

### **C. ADDITIONAL MANAGEMENT MEASURES - FORESTRY**

**PURPOSE OF MANAGEMENT MEASURE:** The purpose of this management measures is to identify additional management measures necessary to achieve and maintain applicable water quality standards and protect designated uses for land uses where the 6217(g) management measures are already being implemented under existing nonpoint source programs but water quality is still impaired due to identified nonpoint sources.

**CONDITION FROM JANUARY 1998 FINDINGS:** Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures. (1998 Findings, Section X.)

#### **PROPOSED FINDING:**

**Option A:** Oregon has not satisfied this condition. By not satisfying this measure, Oregon has failed to submit an approvable program under CZARA.

**Option B:** While EPA and NMFS work through a new pesticide registration process, the federal agencies strongly recommend the State of Oregon consider 1) specific outreach to aerial applicators of herbicides with required elements that minimize aerial drift on Type N (non-fish bearing) streams and surrounding communities; 2) monitoring herbicides in non-fish bearing streams in the coastal zone management area; 3) tracking and reporting the compliance of applicators in following EPA label requirements; 4) Better mapping of N-type streams and other sensitive sites and structures and 5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams.

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#### **RATIONALE:**

**Option A:** The federal agencies have determined that Oregon has not satisfied this condition because Oregon has a unique landscape where aerial application of herbicides on non-fish bearing streams occur that are not taken into account by EPA's pesticide labels under the Federal Insecticide, Rodenticide, and Fungicide Act (FIFRA). To address this, the federal agencies would find the State's program approvable if it included 1) specific outreach to aerial applicators of herbicides with required elements that minimize aerial drift on Type N (non-fish bearing) streams and surrounding communities; 2) monitoring herbicides in non-fish bearing streams in the coastal zone management area; 3) tracking and reporting the compliance of applicators in following EPA label requirements; 4) Better mapping of N-type streams and other sensitive sites and structures and 5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams.

**Option B:** While EPA and NMFS work through a new pesticide registration process, the federal agencies strongly recommend that the State of Oregon ensure that risks to people, aquatic life, and endangered and threatened species are minimized from aerial application of herbicides on Type N (non-fish bearing streams) by conducting 1) specific outreach to aerial applicators of herbicides with required elements that minimize aerial drift on Type N (non-fish bearing) streams and surrounding communities; 2) monitoring herbicides in non-fish bearing streams in the coastal zone management area; 3) tracking and reporting the compliance of applicators in following EPA label requirements; 4) Better mapping of N-type streams and other sensitive sites and structures and 5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams.

The federal agencies' January 13, 1998, conditional approval findings noted that Oregon had published forest practices rules that require buffer zones for most pesticide applications (OAR 629-620-0400(7)(b)). However, these rule changes did not address aerial application of herbicides on non-fish bearing streams. Aerial application of herbicides, such as glyphosate, 2,4-D, atrazine and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings. In the coastal zone management area, however, non-fish bearing streams comprise 60-70% of the total stream length within the coastal nonpoint management area. These flow directly to fish-bearing streams and/or drinking water supply areas. In addition, there are no required riparian buffers for forest harvests on non-fish bearing streams, so in some areas, trees can be harvested up to the stream banks, and herbicides applied aerially can be delivered directly into streams which then enter fish-bearing streams where aquatic life can be harmed. Oregon's coastal zone management area is home to endangered and threatened coastal coho and steelhead as well as many other salmonid and fish species [*Jenny, check fish maps when back in office.*].

- JW agreed deleted. ifgon needs sils added leted it. ibiting any herbicides from entering into streams. ial application of herbic

Since its 1998 conditional approval findings, Oregon has provided several documents describing the programs it relies on to manage pesticides, most recently in March 2014. In addition to the FPA rule buffers noted above, the state also addresses pesticide issues through the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and federal pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as its voluntary Water Quality Pesticide Management Plan and the state's Pesticide Stewardship Partnership. In its March 2014 submittal, Oregon noted that it specifically relies on best management practices set by ODA and EPA under FIFRA for the protection of small non-fish bearing streams. However, except for a few limited cases where court-ordered buffers are still in place, the national FIFRA label requirements and ODA's best management practices do not speak directly to buffer requirements for the aerial application of herbicides along non-fish bearing streams and are thus, not sufficient to protect water quality and salmon in coastal Oregon (NOAA Communication, 2014).

*Unique Conditions in Oregon*

# Ex. 5 - Deliberative

(EPA, 1997)<sup>1</sup>. However, in Oregon, aerial application often occurs 70 to 80 feet above the land because of tree height and over steep terrain, enabling the chemicals to more readily drift into adjacent waterways.

## Ex. 5 - Deliberative

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Studies in Oregon have found positive detections in water after aerial application (Dent and Robben, 2000; Kelly et al., 2012; Oregon Health Authority, 2014). These levels have been below thresholds of concern determined in the studies for people and aquatic life, though, none to date have focused on monitoring the effects of aerial application and drift of herbicides on non-fish bearing streams in Oregon's coastal zone area. FIFRA label requirements vary (EPA, 2013; EPA, 1993), including some that restrict herbicides from entering the water, such that even low levels of herbicides measured in these studies in Oregon may not be in adherence with FIFRA.

Compared to neighboring states and jurisdictions, Oregon has the smallest forestry-specific water resource buffers. For smaller non-fish bearing streams, Washington maintains a 50-foot buffer ([http://www.dnr.wa.gov/Publications/fp\\_rules\\_ch222-38wac.pdf](http://www.dnr.wa.gov/Publications/fp_rules_ch222-38wac.pdf)). Bureau of Land Management (BLM) lands in Oregon require that "no herbicide treatments should occur within 100 feet of a well or 200 feet of a spring or known diversion used as a domestic water source unless a written waiver is granted by the user of owner" ([http://www.blm.gov/or/plans/vegtratmentsseis/files/Veg\\_Treatments\\_ROD\\_Oct2010.pdf](http://www.blm.gov/or/plans/vegtratmentsseis/files/Veg_Treatments_ROD_Oct2010.pdf)). For drift control, Oregon has guidance for considering temperature, relative humidity, wind speed and direction for drift control. However, Washington, California, and BLM have prescriptive technology and weather-related best management practices to address drift control (Peterson, 2011).

*FIFRA Labels* - JW agreed deleted. ifgon needsils added leted it. ibiting any herbicides from entering into streams. ial application of herbic

As the result of several pesticide-related lawsuits regarding how federal agencies evaluate the impacts of pesticides on ESA-listed species and establish label requirements, EPA, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture requested the National Academies of Science to review existing methods for assessing pesticide risk to listed species and to recommend improvements to the risk assessment process. The federal agencies have agreed to work jointly to implement the study's recommendations, which were released April 30, 2013, in a phased, iterative approach over the next 15 years. As a result, the agencies are in the process of modifying the methods for risk

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<sup>1</sup> EPA Office of Pesticide Programs, Environmental Fate and Effects Division, December 10-11, 1997 Science Advisory Panel. Annual Spray Drift Review.

assessment that may affect the future labeling requirements and best management practices for herbicide applications. (ESA, (BEST), (DELS), & Council, 2013)

While the federal agencies are moving forward with a national solution with how risk assessments for pesticide label requirements are conducted, that does not preclude Oregon from taking action to ensure water quality and designated uses are protected in its own state before the federal process is complete. Option A: The agencies could approve the State's pesticide condition under forestry with the following: Option B: The federal agencies strongly recommend the State conduct the following:

- Specific outreach to aerial applicators of herbicides in coastal areas with training specifically focused on:
  - Application of pesticides as close to the crop canopy and at the slowest air speed that is safe for flight;
  - Applications when wind speed is between 1-10 mph;
  - Applications when wind is blowing away from sensitive sites or structures;
  - Calibration of nozzles and repair of leaks;
  - Correct nozzle selection, angle of release and placement on wingspan;
  - Use of largest droplet size possible to ensure crop coverage;
  - Use of drift reducing adjuvants;
  - Use of spray shields;
  - Evaluation of local meteorological conditions to evaluate most appropriate times of year, time of day or windows when weather patterns are conducive to effective aerial applications;
  - Use of maps and GPS to automatically shut off nozzles when crossing N-type streams and other sensitive sites;
  - Notification of bystanders, homes and businesses in close proximity to aerial applications.
- Effectiveness monitoring of herbicides in non-fish bearing streams in coastal areas pre- and post-application coordinated with the federal agencies to determine appropriate location, frequency, and parameters;
- Tracking and reporting the compliance of applicators in following EPA label requirements;
- Better mapping of N-type streams and other sensitive sites and structures;
- Better, more timely, specific, and transparent, public notification processes for all citizens near spray areas, rather than just of bystanders, homes and businesses in close proximity to aerial applications, to inform timing for monitoring pre- and post-aerial application of herbicides

In addition to its reliance on federal label requirements, Oregon has taken independent steps to further address pesticide water quality issues. In 2007, key state agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, worked together to develop an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect

surface and groundwater from potential impacts of pesticides, including herbicides. The plan, approved by EPA Region 10 in 2011, focuses on using water quality monitoring data as the driver for adaptive management actions. The plan describes a continuum of management responses, ranging from voluntary to regulatory actions the state could take to address pesticide issues. If water quality concerns cannot be addressed through the collaborative, interagency-effort, regulatory actions are taken using existing agency authorities.

As outlined in the plan, the State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact.

NOAA and EPA acknowledge the progress Oregon has made in its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. However, the federal agencies note that water quality monitoring data on pesticides is still limited in the State, and that Oregon has only established eight PSP monitoring areas in seven watersheds, none of which are within the coastal nonpoint management area. While NOAA and EPA recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices within the coastal nonpoint management area. The federal agencies encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NMFS biological opinions that assess the impact of EPA label requirements on listed species.

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**CONDITION FROM JANUARY 1998 FINDINGS:** ~~Within two years, Oregon will finalize its proposal to inspect operating OSDS, as proposed on page 143 of its program submittal. (1998 Findings, Section IV.C) Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures. (1998 Findings, Section X.)~~

**Comment [CJ1]:** Please add the correct information. *Done - JW.*

**PROPOSED FINDING:**

**Option A:** Oregon has not satisfied this condition. By not satisfying this measure, Oregon has failed to submit an approvable program under CZARA.

**Option B:** ~~While EPA and NMFS work through a new pesticide registration process, the federal agencies strongly recommend the State of Oregon consider additional training requirements for 1) specific outreach to aerial applicators of herbicides with required elements that minimize aerial drift on Type N (non-fish bearing) streams and surrounding communities; 2) monitoring herbicides in non-fish bearing streams in the coastal zone management area; 3) tracking and reporting the compliance of applicators in following EPA label requirements; 4) Better mapping of N-type streams and other sensitive sites and structures and 5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams. a applicators to minimize risks to people, aquatic life, and endangered and threatened species.~~  
~~Disapproval~~

**Comment [CJ2]:** Does EPA and NOAA need to work through these issues before we can even consider removing our disapproval or can we remove our disapproval if Oregon adopts our recommendations even if these issues have not been worked out? - *JW - If we disapprove, we have specific suggestion for Oregon not related to the FIFRA labels, but related to State's outreach and monitoring.*

**Comment [JW3]:**

**Comment [AC4]:** That's presumptive - *JW - changes made*

**Comment [CJ5]:** Not sure what this "target" means in this context. -*JW - can't find "target" so I may have deleted it.*

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**RATIONALE:**

**Option A:** The federal agencies have determined that Oregon has not satisfied this condition because Oregon has a unique landscape where aerial application of herbicides on non-fish bearing streams occur that are not taken into account by EPA's pesticide labels under the Federal Insecticide, Rodenticide, and Fungicide Act (FIFRA). To address this, the federal agencies would find the State's program approvable if it included 1) specific outreach to aerial applicators of herbicides with required elements that minimize aerial drift on Type N (non-fish bearing) streams and surrounding communities; 2) monitoring herbicides in non-fish bearing streams in

the coastal zone management area; 3) tracking and reporting the compliance of applicators in following EPA label requirements; 4) Better mapping of N-type streams and other sensitive sites and structures and 5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams.

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#### *Buffers for Herbicide Application on Type N Streams*

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The federal agencies' January 13, 1998, conditional approval findings noted that Oregon had published forest practices rules that require buffer zones for most pesticide applications (OAR 629-620-0400(7)(b)). However, these rule changes did not address aerial application of herbicides on non-fish bearing streams. Aerial application of herbicides, such as glyphosate, 2,4-D, atrazine and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings. In the coastal zone management area, however, non-fish bearing streams comprise 60-70% of the total stream length within the coastal nonpoint management area. These flow directly to fish-bearing streams and/or drinking water supply areas. In addition, there are no required riparian buffers for forest harvests on non-fish bearing streams, so in some areas, trees can be harvested up to the stream banks, and herbicides applied aerially. As a result, aerial application of herbicides on non-fish bearing streams can be delivered directly into streams which can then be transported downstream to enter fish-bearing streams where aquatic life can be harmed. Oregon's coastal zone management area is home to endangered and threatened coastal coho and steelhead as well as many other salmonid and fish species [Jenny, check fish maps when back in office].

Comment [AC6]: Is this correct. Is it used for other purposes too? - JW - this is what I understand. Others can check.

Comment [AC7]: More specific? - JW added

Comment [AC8]: Do we have better stats on percentage?? - JW added

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Aerial application of herbicides, such as glyphosate, 2,4 D, atrazine and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings.

On December 20, 2013, EPA and NOAA invited public comment on the State's approach to buffers for aerial application of herbicides on Type N (non-fish bearing) streams. In the December 20, 2013 proposed action, the agencies noted Oregon had published forest practice rules that required buffer zones for most pesticide applications. The rules did not, however, contain restrictions for aerial application of herbicides on Type N streams, which the 1998 conditional approval findings and 2004 interim decision document and 2004 findings noted could

Comment [AC9]: Is this correct. Is it used for other purposes too? - JW - this is what I understand. Others can check.

Comment [AC10]: I think it may be getting too in the weeds and confusing to introduce the 2004 interim decision doc to the lay audience who's not familiar with the ins and outs of how we work with states on program level. See my other version of how this could be revised (basically largely reverts back to original Dec. 20<sup>th</sup> language). - JW- agreed

leave those streams at risk. Type N streams comprise a significant portion of stream length in the coastal zone. Note that the term “pesticides” refers to insecticides, herbicides, fungicides, and various other substances used to control pests (U.S. EPA website). - JW agreed deleted if on needsils added leted it. ibiting any herbicides from entering into streams. ial application of herbic

Since its 1998 conditional approval findings, Oregon has provided several documents describing the programs it relies on to manage pesticides, most recently in March 2014. In addition to the FPA rule buffers noted above, the state also addresses pesticide issues through the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and federal pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as its voluntary Water Quality Pesticide Management Plan and the state’s Pesticide Stewardship Partnership. In its March 2014 submittal, Oregon noted that it specifically relies on best management practices set by ODA and EPA under FIFRA for the protection of small non-fish bearing streams. However, except for a few limited cases where court-ordered buffers are still in place, the national FIFRA label requirements and ODA’s best management practices do not speak directly to buffer requirements for the aerial application of herbicides along non-fish bearing streams and are thus, not sufficient to protect water quality and salmon in coastal Oregon (NOAA Communication, 2014).

#### Unique Conditions in Oregon

## Ex. 5 - Deliberative

(EPA, 1997)<sup>1</sup>. However, in Oregon, aerial application often occurs 70 to 80 feet above the land because of tree height and over steep terrain, enabling the chemicals to more readily drift into adjacent waterways.

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Studies in Oregon have found positive detections in water after aerial application (Dent and Robben, 2000; Kelly et al., 2012; Oregon Health Authority, 2014). These levels have been below thresholds of concern determined in the studies for people and aquatic life, though, none to date have focused on monitoring the effects of aerial application and drift of herbicides on non-fish bearing streams in Oregon’s coastal zone area. FIFRA label requirements vary (EPA, 2013; EPA, 1993), including some that restrict herbicides from entering the water, such that even low levels of herbicides measured in these studies in Oregon may not be in adherence with FIFRA.

**Comment [AC11]:** I don’t think we need to rehash what we said on Dec. 20<sup>th</sup>. Just start with what we said in the Dec. 20<sup>th</sup> rationale and update that as needed. - JW - agreed

**Comment [AC12]:** I think the sci you present later on would be more impactful if it comes up front right after you introduce the condition and what OR has or doesn’t have in place. Therefore, there is no questioning why OR needs to provide better protection of non-fish streams for aerial spraying of herbicides. See potential edits in other version. - JW - moved up, but consolidated study results. Could put detail back into rationale if you think it’s better to be more detailed with the findings.

**Comment [AC13]:** I think we need to be very clear up front why we can’t approve OR right now and also by the end of the rationale, need to clearly state what OR needs to do to get to approval. That seems to be missing (or doesn’t come across clearly). I don’t think we can expect OR to wait for the FIFRA label discussions to play out so in the absence of federal action, what can OR do? Can we require the state to do something if the feds aren’t even taking action? How will that be perceived? - JW - added in beginning and more details added at end.

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**Comment [JW14]:**

**Comment [AC15]:** So this is 70-80 ft above the tree tops or 70-80 feet above the land since the trees are so high? Rather than crop, would be good to use “tree canopy” for better clarity if that is an accurate statement. - JW - it’s 70-80 feet above the land.

**Comment [JW16]:** This sentence is getting to the presence/absence bar that even detectable levels of pesticides may not be acceptable under FIFRA even if they were deemed to be below “thresholds of concern” in the study.

<sup>1</sup> EPA Office of Pesticide Programs, Environmental Fate and Effects Division, December 10-11, 1997 Science Advisory Panel. Annual Spray Drift Review.



Compared to neighboring states and jurisdictions, Oregon has the smallest forestry-specific water resource buffers. For smaller non-fish bearing streams, Washington maintains a 50-foot buffer ([http://www.dnr.wa.gov/Publications/fp\\_rules\\_ch222-38wac.pdf](http://www.dnr.wa.gov/Publications/fp_rules_ch222-38wac.pdf)). Bureau of Land Management (BLM) lands in Oregon require that “no herbicide treatments should occur within 100 feet of a well or 200 feet of a spring or known diversion used as a domestic water source unless a written waiver is granted by the user of owner” ([http://www.blm.gov/or/plans/vegtreatmentseis/files/Veg\\_Treatments\\_ROD\\_Oct2010.pdf](http://www.blm.gov/or/plans/vegtreatmentseis/files/Veg_Treatments_ROD_Oct2010.pdf)). For drift control, Oregon has guidance for considering temperature, relative humidity, wind speed and direction for drift control. However, Washington, California, and BLM have prescriptive technology and weather-related best management practices to address drift control (Peterson, 2011).

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FIFRA Labels Oregon’s response noted several regulations the State uses to manage its pesticides program. Specific to small, non-fish bearing streams, Oregon’s coastal nonpoint program relies on the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). For fungicides and nonbiological insecticides, Oregon requires that no spraying occur within 60 feet of a stream with flowing water at the time of application (OAR 629-620-0400(7)(b)). As noted above, however, the State does not have a buffer zone for aerial applications of herbicides? - JW agreed deleted. if on needsils added leted it ibiting any herbicides from entering into streams. ial application of herbicpesticides on non-fish bearing streams.—

**Comment [CJ17]:** Spell out. - JW - section deleted.

**Comment [AC18]:** I’m guessing we will have likely have introduced ODA earlier in the decision rationale so it will be fine to abv here but when we put everything together we can make the final call of where we need to spell things out first and when its ok to use the acronym. - JW agreed

**Comment [CJ19]:** Is this true for all pesticides (insecticides, herbicides, fungicides, and various other substances used to control pests) or just herbicides?

**Comment [JW20]:** Corrected - should be herbicides.

~~The Agencies received thirty-five comments related to the State’s pesticide programs. Several commenters expressed concern on health effects to people and aquatic life from aerial drift of herbicides and the presence of herbicides in blood and urine samples. Others noted that better notification before pesticide application, access to pesticide records, monitoring, and larger buffers were needed. Commenters also supported the State’s program stating that the labeling requirements under FIFRA and best management practices required when applying pesticides were adequate to protect people and aquatic species. Many commenters described studies of pesticide water quality data in the State, all noting that pesticide levels were detected. Some commenters concluded from these studies that pesticide levels were below thresholds of concern, while others concluded that the presence of pesticides showed that State regulations were insufficient to manage pesticides.~~

**Comment [CJ21]:** Do we want to include a summary of comments received in the rationales or just in the response to comments (and issue paper where appropriate) document? I recall a comment suggesting deleting this kind of information in another rationale. - JW - deleted and will put this into response to comments

**Comment [AC22]:** Agree. No need to repeat ourselves in two different documents. The Response to Comments will discuss all the comments received. The decision doc should only provide the rationale for our decision.

**Comment [CJ23]:** What does this mean? I understand ecological risk but not sure what “non-target” means in this context.

**Comment [CJ24]:** Both or which citation?

**Comment [AC25]:** I assume your citations are only temp. place holders and you plan to provide full citations later? To be consistent with how we cited sources in our proposed decision, we should use footnote citations that include full citation for each source.

Because the State relies in large part on FIFRA labeling requirements for requirements on aerial application of herbicides around non-fish bearing streams, the following is a brief description of the program. EPA’s Pesticide Program performs a comprehensive risk assessment that evaluates risk to workers, homeowners, dietary risk, and drinking water risk, and non-target ecological risk. The pesticide risk assessment and registration process result in labeling requirements that vary. Examples of FIFRA label requirements on herbicide application range from prohibitions on aerial application to suggestions on how and where the application occurs (US Environmental Protection Agency, 2012) (U.S. Environmental Protection Agency, 1993).

## Ex. 5 - Deliberative

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coastal, forested areas in Oregon where herbicides are aerially applied in non-fish-bearing streams, aerial application are approximately 70 to 80 feet above the crop canopy (citation).

As the result of several pesticide-related lawsuits regarding how federal agencies evaluate the impacts of pesticides on ESA-listed species and establish label requirements, EPA, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture requested the National Academies of Science to review existing methods for assessing pesticide risk to listed species and to recommend improvements to the risk assessment process. The federal agencies have agreed to work jointly to implement the study's recommendations, which were released April 30, 2013, in a phased, iterative approach over the next 15 years. As a result, the agencies are in the process of modifying the methods for risk assessment that may affect the future labeling requirements and best management practices for herbicide applications. (ESA, (BEST), (DELS), & Council, 2013)

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**Ex. 5 - Deliberative** However, in response to several pesticide-related lawsuits related to the adequacy of federal agencies in evaluating the impacts of pesticides on ESA-listed species, EPA, NOAA's National Marine Fisheries Service (NMFS), the United States Fish and Wildlife Service (USFWS), and the United States Department of Agriculture (USDA) requested the National of Academy of Sciences (NAS) review existing methods for assessing risks of pesticides to listed species and recommend improvements. On April 30, 2013, the NAS released their report, and the agencies agreed to work jointly to implement the recommendations in a phased, iterative approach over 15 years. As a result, the programs are in the process using developing? modified methods for risk assessment that may affect future labeling requirements and best management practices for herbicide applications that could affect ESA listed species. (ESA, (BEST), (DELS), & Council, 2013).

Specific to ESA-related litigation filed in 2001, the Washington Toxics Coalition sued EPA for failing to consult with NOAA's National Marine Fisheries Sired EPA to initiate consultation with NMFS. EPA has since initiated consultation with NMFS on 37 pesticide active ingredients. NMFS has issued six final biological opinions (BiOps) for 29 active ingredients as well as a draft of the seventh BiOp for three remaining additional active ingredients. NMFS has not yet, however, issued BiOps for the five remaining active ingredients nor the seventh BiOp. In the BiOps that have been issued, NMFS concluded that some herbicides are likely to jeopardize some listed species. For these herbicides, NMFS included reasonable and prudent alternatives, such as including buffers around water bodies (if fish and non-fish bearing) during aerial? application. But some of the RPAs are restrictive for agricultural applicators and EPA and agricultural interests have explored alternative mitigation approaches that would provide protection to ESA species but would not be so restrictive on agricultural growers.

**Comment [CJ26]:** Explain why this is a problem in terms of water quality impacts etc..

**Comment [AC27]:** Agree with Jayne's comment above. What does this mean to exposure to pesticides/herbicides or how easily they get into water? Make sure the connection between the science results you present and the points we want to support in our rationale is explicit.

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**Comment [CJ28]:** May want to apply directly to Oregon's coasts and note whether there are ESA listed species located on Oregon's coast and that could be impacted by herbicide applications -*JW* included in first paragraph

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**Comment [CJ29]:** Confusing citation - *JW* - will clean up citation; used Word function to input entire citation, but this is what they came up with. Will edit later.

**Comment [CJ30]:** Are any of these active ingredients for herbicides? - *JW*, yes.

**Comment [AC31]:** Acknowledge that original court-ordered buffers are still in place for these.

**Comment [AC32]:** Specify which ones or at least examples of the more prevalent ones?

**Comment [AC33]:** For both fish and non-fish bearing streams that directly flow into fish-bearing streams, correct?

In summary, there are several ongoing efforts between federal agencies to reevaluate the pesticide risk assessment process which may result in FIFRA labeling requirements that will take into account the risks to ESA-listed species. In some cases, NMFS has already determined jeopardy on the impacts of some herbicides to ESA-listed species from herbicides on non-fish-bearing streams.

**Comment [CJ34]:** Can you include a sentence that describes the relevance of these findings to the basis for our disapproval or how these informs our decision?

In addition to ongoing work on EPA's pesticide risk assessment, several studies have evaluated studied effects from aerial drift of herbicides from forestry applications. In March 2000, ODF's study on aerial pesticide application monitoring in Oregon coastal areas measured trace levels of less than 1 part per billion (ppb) of herbicides in seven of 25 stream sites adjacent to post-spray applications (Dent & Robben, 2000). These levels were well below thresholds of concern established in the study for people, fish, and invertebrates. However, the study also noted that its focus was on water quality protection of streams with riparian buffer requirements, such as fish-bearing and domestic use streams, and did not address small non-fish bearing streams that do not have overstory riparian buffer requirements. In Oregon also described a USGS study in the McKenzie River of the Clackamas Basin, outside the coastal zone management area. Of 175 compounds, 43 out of 175 compounds were detected at least once across 28 sites. The study focused on urban, forestry, and agricultural land uses. Nine pesticides were detected out of 14 samples from the drinking water facility's intake from 2002 to 2010. However, concentrations were low, less than 1 part per billion, and the largest number of pesticide detections were associated with urban stormwater (Kelly et al. 2012).

**Comment [CJ35]:** At the end of your descriptions of these studies, can you explain the relevance of these studies to our disapproval decision or how these studies are being used to inform our decision?

**Comment [CJ36]:** Spell out

**Comment [AC37]:** Was it a specific herbicide or did they measure several different kinds? Even so, it would be handy to note which ones since toxicity varies based on the type of herbicide so helps put the 1ppb into context.

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**Comment [AC38]:** So what does this mean for the points we are trying to support in our rationale?? Be explicit about the connection to water quality, etc. Does it indicate that observed pesticide levels in these streams may be even greater after a spray event and exceed toxic thresholds?

EPA evaluated non-fish bearing streams in the Highway 36 area in the midcoast of Oregon to look at the potential of herbicide transport downstream to fish-bearing streams. (Peter L and Alan talk with Friday.)

**Comment [AC39]:** It's not clear to me how this study helps the points we want to make in our rationale....urban stormwater runoff is a bigger culprit of pesticides than forestry? Not sure that helps us? Either make the connection more explicit to the points we want to make or consider taking out.

It is also important to note an ongoing Exposure Investigation (EI) for the Highway 36 Corridor in the mid-coast region of Oregon in the Coastal Zone Management Area (Oregon Health Authority, Draft Final, 2014). EPA and NOAA received several comments related to aerial application of herbicides in the Highway 36 Corridor. Conclusions from the ongoing Exposure Investigation (EI) for the Highway 36 Corridor in the mid-coast region of Oregon in the Coastal Zone Management Area show that residents were exposed to herbicides during the investigation period, but it is not possible to confirm whether these exposures resulted from the aerial application of pesticides or from another source. Low levels of herbicides applied during aerial applications were found in 10 soil samples, but no herbicides were found in drinking water samples. EPA will be conducting air monitoring to determine the public health significance from aerial application of herbicides in the Highway 36 Corridor. (Oregon Health Authority, Draft Final, 2014).

**Comment [AC40]:** Is this Triangle Lake area or somewhere else? If Triangle, make be good to note that for those of us that may be less familiar with the Hwy 36 reference. But perhaps for Oregonians, this is all very clear?

While the federal agencies are moving forward with a national solution with how risk assessments for pesticide label requirements are conducted, that does not preclude Oregon from taking action to ensure water quality and designated uses are protected in its own state before the federal process is complete. Option A: The agencies could approve the State's pesticide

**Comment [AC41]:** Again, what do these results mean for the points we want to make in our rationale—that aerial spraying for herbicides under current no-buffer restrictions is bad for water quality/designated uses and OR needs better protections?

condition under forestry with the following: Option B: The federal agencies strongly recommend the State conduct the following:

- Specific outreach to aerial applicators of herbicides in coastal areas with training specifically focused on:
  - Application of pesticides as close to the crop canopy and at the slowest air speed that is safe for flight;
  - Applications when wind speed is between 1-10 mph;
  - Applications when wind is blowing away from sensitive sites or structures;
  - Calibration of nozzles and repair of leaks;
  - Correct nozzle selection, angle of release and placement on wingspan;
  - Use of largest droplet size possible to ensure crop coverage;
  - Use of drift reducing adjuvants;
  - Use of spray shields;
  - Evaluation of local meteorological conditions to evaluate most appropriate times of year, time of day or windows when weather patterns are conducive to effective aerial applications;
  - Use of maps and GPS to automatically shut off nozzles when crossing N-type streams and other sensitive sites;
  - Notification of bystanders, homes and businesses in close proximity to aerial applications.
- Effectiveness monitoring of herbicides in non-fish bearing streams in coastal areas pre- and post-application coordinated with the federal agencies to determine appropriate location, frequency, and parameters;
- Tracking and reporting the compliance of applicators in following EPA label requirements;
- Better mapping of N-type streams and other sensitive sites and structures;
- Better, more timely, specific, and transparent, public notification processes for all citizens near spray areas, rather than just of bystanders, homes and businesses in close proximity to aerial applications, to inform timing for monitoring pre- and post-aerial application of herbicides

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In addition to its reliance on federal label requirements, Oregon has taken independent steps to further address pesticide water quality issues. In 2007, key state agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, worked together to develop an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect surface and groundwater from potential impacts of pesticides, including herbicides. The plan, approved by EPA Region 10 in 2011, focuses on using water quality monitoring data as the driver for adaptive management actions. The plan describes a continuum of management responses, ranging from voluntary to regulatory actions the state could take to address pesticide issues. If water quality concerns cannot be addressed through the collaborative, interagency-effort, regulatory actions are taken using existing agency authorities.

As outlined in the plan, the State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact.

NOAA and EPA acknowledge the progress Oregon has made in its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. However, the federal agencies note that water quality monitoring data on pesticides is still limited in the State, and that Oregon has only established eight PSP monitoring areas in seven watersheds, none of which are within the coastal nonpoint management area. While NOAA and EPA recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices within the coastal nonpoint management area. The federal agencies encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NMFS biological opinions that assess the impact of EPA label requirements on listed species.

~~At the State level, Oregon has taken independent steps to address pesticide water quality issues. Key State agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, formed a team in 2007 that developed an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect surface and groundwater from potential impacts of current pesticides. The plan, approved by EPA Region 10 in 2011, focuses on using water monitoring data as the driver for adaptive management actions. The plan includes a continuum of management responses, ranging from voluntary to regulatory actions. Regulatory actions are implemented using existing agency authorities, if the water quality concerns cannot be addressed through the collaborative team effort. The State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact. The federal agencies acknowledge the process compliment Oregon has made for its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. If fully implemented, where needed, across the coastal nonpoint management area, these actions would represent strong management measures for helping the State address key pesticide issues.~~

EPA's and NOAA's original basis for disapproval was inadequate riparian buffers for aerial application of herbicides on non-fish bearing streams. In addition to non-fish bearing streams comprising a large part of coastal stream length, there are additional opportunities for herbicides to enter streams through runoff since non-fish bearing streams lack buffer requirements. Thus

**Comment [AC42]:** May want to tone down lang. a bit since several commenters took fault at EPA/NOAA for appearing to praise OR so highly for efforts that still need a lot of work and aren't even w/in coastal nps area.

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**Comment [AC43]:** Does that mean if OR fully implements we would approve this element of the add MMs for forestry condition? I know this is carry over lang from the Dec. proposed findings doc but we should be very clear what OR needs to do to get to approval for this issue. If we will accept "fully implementing the PSP, what does that mean?

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far, limited studies have shown low levels of pesticides below thresholds of concern. However, it is important to note that depending on pesticide label requirements and based on the toxicity of the pesticide, even detectable levels of pesticides may not be in adherence to FIFRA requirements, depending on the level of restrictions on aerial application of the product herbicides.

Aerial drift and their effects on aquatic life and people remain a concern. The federal agencies note that water quality monitoring data on pesticides are still limited in the State and that ODEQ has only established eight PSP areas in seven watersheds, none of which are located within the coastal nonpoint management area. While the federal agencies recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices. These studies should include several sites within the coastal nonpoint management area. The federal agencies also encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NOAA BiOps.

Finally, while EPA and NMFS work through a new pesticide registration process and litigation and ultimately to implement sufficient adequate protections of target waterways to protect people and aquatic life, the federal agencies strongly recommend the State of Oregon consider including the following in the State's next Pesticide Management Plan to reduce and minimize impacts of herbicide exposure from aerial applications to people and aquatic life. These recommendations include:

- State-specific buffers on non-fish bearing streams for aerial application of herbicides and pesticides such as the recommended buffers in the NMFS BiOps;
- Herbicide application guidelines for buffer and drift control such as reduced droplet size, consideration of terrain and weather conditions, better mapping of spray application area;
- Better, more timely, specific, and transparent, public notification processes for all citizens near spray areas, rather than just of bystanders, homes and businesses in close proximity to aerial applications, beyond community water managers prior to spraying;
- Better record keeping and transparency of public records;
- Increased training and guidance for applicators; and
- Increased effectiveness monitoring of pesticides and best management practices within the coastal nonpoint management area;
- Better mapping of N-type streams and other sensitive sites and structures;

- State specific aerial application guidelines for drift control of pesticides;
- Annual applicator training, guidance and outreach for aerial applicators on how to reduce drift;
- The application guidelines and aerial applicator training should address such things as:

**Comment [AC44]:** These points should be made earlier on. Also, I find the sentence: "Thus far, limited studies have shown low levels of pesticides below thresholds of concern" confusing. So are we saying few studies have observed pesticides levels below "safe" levels? Or are we commenting that there isn't a lot of research out there on pesticide levels after spray events? Need to make sure statement is supported with citations.

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**Comment [AC45]:** I don't understand this? What are we trying to say here?

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**Comment [AC46]:** This seems a bit disjointed. Talked about PSP above and a few para below return to it. Would be helpful to talk about all PSP info together.

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**Comment [CJ47]:** Does EPA and NOAA need to work through these issues before we can even consider removing our disapproval or can we remove our disapproval if Oregon adopts our recommendations even if these issues have not been worked out?

**Comment [AC48]:** That's presumptive

**Comment [CJ49]:** Not sure what this "target" means in this context.

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**Comment [CJ50]:** If Oregon accepts all of our recommendations, will we remove our disapproval? If so, do they need to accept them all or are there key ones that need to be accepted in order to obtain our approval?

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**Comment [AC51]:** Why limit ourselves to just non-fish bearing here? BiOps have shown that larger buffers are needed elsewhere too.

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**Comment [AC52]:** So if OR does this, and meets the other elements of a voluntary program, would we approve this element? Need to be clear on what the bar is and how OR could reach it. Otherwise they have the right to complain that we are continuously moving it on them. -JW - added info on the bar.

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~~Application of pesticides as close to the crop canopy and at the slowest air speed that is safe for flight;~~  
~~Applications when wind speed is between 1-10 mph;~~  
~~Applications when wind is blowing away from sensitive sites or structures;~~  
~~Calibration of nozzles and repair of leaks;~~  
~~Correct nozzle selection, angle of release and placement on wingspan;~~  
~~Use of largest droplet size possible to ensure crop coverage;~~  
~~Use of drift reducing adjuvants;~~  
~~Use of spray shields;~~  
~~Evaluation of local meteorological conditions to evaluate most appropriate times of year, time of day or windows when weather patterns are conducive to effective aerial applications;~~  
~~Use of maps and GPS to automatically shut off nozzles when crossing N-type streams and other sensitive sites;~~  
~~Notification of bystanders, homes and businesses in close proximity to aerial applications;~~

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